

UNITED STATES NAVAL OBSERVATORY
CIRCULAR NO. 73

U. S. Naval Observatory, Washington 25, D. C.

April 1, 1957

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS
SEPTEMBER, 1956

By Winifred Sawtell Cameron

These results are based upon measurements made at the Naval Observatory on plates secured either there or at the Mt. Wilson Observatory. The symbols used for the entries in the successive columns are as follows:

U.T., the epoch of observation in Universal Time.

No., the identifying number of the group assigned by Mt. Wilson.

Δl , the heliographic difference in longitude from the central meridian, measured positive to the west.

φ , the heliographic latitude, measured positive to the north.

ρ , the heliocentric angular distance from the line joining the centers of the Earth and Sun.

A , the true area of the umbra plus penumbra, expressed in millionths of the visible hemisphere.

s , the number of spots.

An asterisk means that no Mt. Wilson number was assigned. Plates secured at the Naval Observatory are indicated by N, and those at Mt. Wilson by M. The plate quality, which follows, is indicated by:

1, Poor; 2, Fair; 3, Good; 4, Very Good; 5, Excellent.

The following five quantities are listed successively at the end of each day, and give for that day:

1. The total number of groups, g .
2. The longitude of the central meridian, L_0 .
3. The latitude of the center of the disc, B_0 .
4. The total value of A .
5. The total value of s .

The mean daily area and the mean relative sunspot number, $r=10g+s$ are given at the end of the month.

These results are a continuation of those published in the *Monthly Weather Review* from February 1, 1927 to December 31, 1947.

SEPTEMBER

U.T.	No.	Δl	φ	ρ	A	s	U.T.	No.	Δl	φ	ρ	A	s	
1.537	11791	-50	+16	50	12	1		11779	+6	+17	13	194	4	
N-2	11783	-24	+34	35	24	3		11776	+14	-29	39	97	3	
	11783	-23	+35	35	6	1		11776	+15	-28	39	16	1	
	11783	-22	+33	34	73	2		11776	+16	-29	40	12	1	
	11783	-21	+34	34	6	1		11776	+22	-31	44	32	1	
	11783	-19	+34	33	6	4		11776	+23	-29	43	170	2	
	11783	-18	+33	32	24	2		11789	+27	+23	31	73	2	
	11783	-17	+33	32	73	3		11789	+27	+21	30	36	2	
	11783	-17	+31	29	16	3		11789	+29	+22	32	16	1	
	11783	-15	+31	27	24	2		11789	+30	+23	34	16	1	
	11783	-13	+30	26	339	3		11789	+32	+23	35	32	1	
	11781	-14	+13	15	170	1		11789	+34	+23	36	61	1	
	11781	-12	+16	15	6	1		11786	+39	+20	41	24	2	
	11779	-9	+18	15	12	1		11773	+63	+23	64	48	1	
	11779	-7	+17	13	267	2		11773	+68	+24	67	24	1	
	11782	-8	-28	36	32	1		11784	+69	-23	74	61	1	
	11777	-6	+18	14	24	1		(11)	(83)	(+7)		2309	55	
	11777	-6	+16	12	48	2		3.718	11792	-57	-14	61	16	1
	11777	-4	+18	13	48	2	N-2	11792	-53	-14	56	16	1	
	11777	-3	+18	13	32	3		11783	+4	+36	30	12	1	
	11777	0	+17	12	436	4		11783	+5	+34	28	48	2	
	11776	+1	-29	36	121	1		11783	+6	+36	30	97	5	
	11776	+2	-28	36	48	3		11783	+10	+33	27	16	1	
	11776	+3	-30	37	48	2		11783	+11	+33	27	12	1	
	11776	+7	-29	37	73	3		11783	+13	+32	28	61	2	
	11776	+8	-31	39	16	1		11783	+13	+31	26	48	2	
	11776	+10	-29	38	194	2		11783	+16	+31	27	388	1	
	11789	+14	+21	20	36	6		11781	+15	+14	17	182	1	
	11789	+17	+23	23	48	1		11779	+22	+17	24	73	2	
	11786	+21	+22	25	12	1		11777	+23	+19	26	12	1	
	11786	+24	+21	27	24	1		11777	+26	+18	28	12	1	
	11784	+52	-25	59	12	1		11777	+26	+17	28	16	1	
	11784	+56	-23	62	73	1		11777	+28	+17	30	12	1	
	11773	+54	+24	55	16	1		11777	+29	+17	31	388	2	
	(11)	(97)	(+7)		2399	67		11776	+27	-29	45	48	1	
2.593	11792	-73	-16	76	48	2		11776	+30	-30	46	24	2	
N-3	11791	-36	+17	37	6	1		11776	+35	-30	50	16	1	
	11783	-11	+35	30	32	1		11776	+36	-30	51	182	2	
	11783	-10	+33	27	48	2		11789	+41	+22	43	121	3	
	11783	-9	+34	28	16	2		11789	+44	+21	45	24	1	
	11783	-7	+34	28	16	1		11789	+48	+22	49	61	1	
	11783	-6	+34	28	16	2		11789	+48	+21	49	16	1	
	11783	-5	+33	26	48	2		11789	+50	+22	51	230	2	
	11783	-3	+33	26	48	2		11773	+79	+23	78	85	1	
	11783	-2	+32	24	12	1		11773	+81	+22	80	73	1	
	11783	-1	+30	24	48	1		(8)	(68)	(+7)		2289	42	
	11783	-1	+33	25	16	1		4.544	11796	-78	-15	80	24	1
	11783	+1	+30	24	339	1	N-2	11792	-46	-16	51	16	1	
	11781	0	+13	6	158	1		11792	-45	-15	50	61	2	
	11777	+3	+22	15	6	1		11792	-40	-15	45	36	1	
	11777	+4	+22	15	6	1		11795	-17	+8	17	12	1	
	11777	+4	+18	12	6	1		11795	-15	+8	15	32	2	
	11777	+7	+18	14	12	1		11783	+14	+34	30	24	3	
	11777	+9	+17	15	24	1		11783	+16	+35	32	48	3	
	11777	+10	+18	16	24	1		11783	+23	+32	34	48	2	
	11777	+12	+17	16	48	1		11783	+24	+33	35	6	1	
	11777	+14	+17	18	388	2								
	11779	+5	+16	11	32	1								

SEPTEMBER

U.T.	No.	Δl	φ	ρ	A	s	U.T.	No.	Δl	φ	ρ	A	s
		$^{\circ}$	$^{\circ}$	$^{\circ}$					$^{\circ}$	$^{\circ}$	$^{\circ}$		
	11783	+24	+31	33	36	4		11797	-68	-28	74	32	1
	11783	+24	+28	32	12	2		11797	-66	-26	72	582	7
	11783	+26	+31	34	339	2		11797	-62	-26	68	242	2
	11781	+27	+14	28	182	1		11796	-56	-18	61	242	3
	11779	+30	+20	33	6	1		11796	-54	-16	58	121	3
	11779	+33	+17	35	61	1		11796	-50	-16	55	48	2
	11776	+40	-29	53	48	1		11796	-46	-16	51	85	1
	11776	+42	-30	55	16	2		11792	-18	-16	30	24	2
	11776	+49	-30	60	170	1		11792	-16	-16	28	16	1
	11777	+41	+17	42	291	3		11792	-14	-15	26	48	2
	11789	+51	+22	52	182	4		11800	+ 4	-33	40	6	1
	11789	+52	+20	53	73	6		11800	+ 6	-34	42	12	1
	11789	+55	+21	56	158	3		11799	+16	-19	31	12	1
	11789	+59	+23	60	12	1		11798	+28	+25	34	109	1
	11789	+62	+23	63	339	3		11798	+31	+26	35	12	1
	(9)	(57)	(+7)		2232	52		11798	+32	+25	36	24	2
5,549	11797	-80	-24	85	291	1		11783	+50	+32	53	315	2
N-4	11797	-76	-26	80	242	2		11781	+53	+14	53	182	1
	11796	-70	-18	74	339	1		11777	+67	+17	66	242	2
	11796	-69	-16	73	16	2		11776	+68	-29	76	32	1
	11796	-67	-17	71	97	2		11776	+74	-29	80	315	3
	11796	-64	-16	67	48	2		11789	+76	+22	75	194	1
	11796	-63	-16	66	24	2		11789	+80	+23	78	73	1
	11792	-34	-15	40	48	5		11789	+85	+21	84	16	1
	11792	-32	-14	38	12	2		(11)	(30)	(+7)		4366	50
	11792	-32	-15	39	12	3	7,742	11797	-61	-25	67	194	2
	11792	-30	-14	37	12	1	N-2	11797	-59	-23	66	485	3
	11792	-28	-14	36	6	2		11797	-58	-26	65	242	1
	11792	-26	-15	35	48	1		11797	-57	-27	66	267	1
	11783	+26	+35	37	6	1		11797	-55	-24	62	291	1
	11783	+28	+36	40	6	1		11797	-52	-25	59	339	3
	11783	+29	+35	39	12	1		11797	-48	-26	57	291	1
	11783	+30	+35	40	6	1		11797	-47	-24	55	291	2
	11783	+35	+33	42	16	3		11796	-41	-17	47	267	2
	11783	+36	+32	42	16	2		11796	-34	-15	40	32	1
	11783	+36	+29	41	16	2		11796	-31	-16	38	109	2
	11783	+38	+32	44	291	2		11804	-37	+14	37	6	1
	11781	+39	+14	39	145	1		11803	-17	+22	23	16	1
	11779	+45	+17	46	24	2		11792	- 2	-14	22	24	4
	11779	+46	+18	47	24	1		11792	0	-14	22	24	1
	11779	+48	+17	49	16	1		11792	+ 2	-14	22	48	1
	11777	+54	+17	55	339	1		11800	+17	-34	45	12	1
	11776	+63	-30	69	121	1		11802	+44	+21	45	6	1
	11776	+65	-28	71	16	1		11802	+47	+18	47	24	1
	11789	+63	+22	63	242	1		11798	+45	+24	47	61	1
	11789	+64	+21	63	36	1		11798	+49	+24	51	24	1
	11789	+64	+24	63	24	1		11801	+53	+15	53	12	1
	11789	+64	+20	63	48	2		11801	+55	+14	55	12	1
	11789	+67	+22	66	48	3		11783	+66	+31	65	291	1
	11789	+76	+23	74	291	1		11781	+70	+13	69	145	1
	(9)	(44)	(+7)		2938	56		11781	+75	+11	74	73	1
6,574	11797	-75	-23	79	170	1		11777	+85	+16	84	194	1
N-4	11797	-75	-26	80	388	1		(12)	(15)	(+7)		3780	38
	11797	-74	-24	78	388	1	8,706	11797	-46	-26	56	267	1
	11797	-70	-24	75	48	1	N-1	11797	-44	-23	52	388	3
	11797	-68	-25	73	388	3		11797	-44	-26	54	145	1

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U.T.	No.	Δl	φ	ρ	A	s	U.T.	No.	Δl	φ	ρ	A	s
		$^{\circ}$	$^{\circ}$	$^{\circ}$					$^{\circ}$	$^{\circ}$	$^{\circ}$		
	11797	-41	-28	53	170	2		11796	+4	-15	24	24	2
	11797	-40	-24	49	339	2		11796	+6	-16	25	32	2
	11797	-37	-26	50	582	3		11796	+10	-16	26	109	1
	11797	-34	-24	46	218	1		11806	+9	+26	22	12	1
	11797	-34	-26	47	291	1		11792	+37	-14	43	12	1
	11796	-27	-18	37	97	1		11792	+39	-14	44	12	1
	11796	-27	-17	36	145	1		11792	+42	-15	46	12	1
	11796	-24	-16	34	24	1		11792	+44	-14	48	12	1
	11796	-22	-15	31	16	1		(8) (338) (+7)			3848	53	
	11796	-20	-16	31	16	1	11.633	11811	-74	-19	76	36	1
	11796	-19	-14	28	32	1	N-2	11811	-72	-17	75	48	1
	11796	-16	-15	27	97	1		11811	-71	-16	74	73	1
	11806	-16	+25	24	24	1		11811	-70	-17	74	48	1
	11792	+11	-15	25	73	1		11811	-69	-16	72	97	1
	11792	+14	-15	26	16	1		11811	-65	-16	68	194	1
	11792	+15	-15	26	48	1		11812	-73	+21	72	97	1
	11802	+63	+19	63	97	1		11812	-70	+23	69	121	1
	11783	+79	+32	78	242	2		11809	-67	-22	71	291	1
	(6) (2) (+7)				3327	28		11809	-64	-20	68	291	1
9.606	11807	-80	-26	85	145	1		11815	-66	-24	71	97	2
N-2	11797	-36	-27	49	12	1		11815	-63	-23	68	48	1
	11797	-34	-27	48	242	1		11815	-61	-24	66	24	1
	11797	-34	-25	46	48	1		11808	-56	-19	62	73	1
	11797	-33	-27	47	145	1		11807	-52	-26	59	242	2
	11797	-32	-24	45	412	3		11814	-33	+20	35	16	1
	11797	-29	-28	45	145	2		11797	-8	-25	34	73	2
	11797	-27	-25	42	242	4		11797	-7	-27	35	242	3
	11797	-24	-27	42	485	4		11797	-6	-26	34	109	1
	11797	-21	-26	38	727	3		11797	-6	-28	36	48	1
	11796	-14	-18	29	388	4		11797	-5	-24	32	291	2
	11796	-11	-17	26	24	1		11797	-5	-28	36	61	1
	11796	-9	-16	26	24	2		11797	-5	-21	27	97	1
	11796	-6	-16	25	24	1		11797	-3	-24	32	48	3
	11796	-3	-16	24	97	1		11797	-3	-27	36	97	2
	11806	-4	+24	17	16	1		11797	-1	-25	33	48	4
	11792	+23	-15	32	48	1		11797	+1	-26	34	679	2
	11792	+27	-15	35	24	1		11797	+2	-24	32	24	2
	(5) (350) (+7)				3248	33		11797	+3	-27	35	194	3
10.551	11811	-87	-20	88	97	1		11797	+5	-26	34	170	2
N-2	11809	-85	-22	86	194	1		11797	+7	-26	34	533	3
	11809	-80	-20	83	194	1		11796	+11	-19	28	97	2
	11809	-79	-19	81	121	1		11796	+12	-16	26	121	2
	11809	-75	-20	77	97	1		11796	+13	-18	28	36	1
	11812	-85	+24	84	97	1		11796	+21	-17	32	36	2
	11807	-69	-26	75	194	1		11796	+22	-16	32	24	2
	11797	-22	-26	39	339	3		11796	+25	-16	34	97	1
	11797	-20	-26	38	145	1		(9) (323) (+7)			4921	60	
	11797	-19	-23	35	388	3	12.542	11824	-80	+26	78	12	1
	11797	-17	-24	35	32	5	N-3	11823	-80	-31	88	194	1
	11797	-17	-26	37	48	6		11816	-73	-26	78	24	2
	11797	-17	-27	39	36	2		11816	-65	-24	70	48	1
	11797	-14	-26	36	679	8		11811	-64	-19	68	194	1
	11797	-7	-26	35	679	4		11811	-61	-18	65	194	3
	11796	-3	-19	27	73	1		11811	-57	-18	63	242	6
	11796	-2	-17	25	194	2		11811	-54	-18	59	242	3
	11796	0	-16	24	16	1		11812	-60	+19	61	73	1

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U.T.	No.	Δl	φ	ρ	A	s	U.T.	No.	Δl	φ	ρ	A	s	
	11812	-60	+21	61	16	2		11811	-46	-19	53	73	4	
	11812	-58	+23	59	121	3		11811	-45	-19	52	73	2	
	11809	-56	-21	61	73	1		11811	-43	-18	49	194	6	
	11809	-56	-23	63	242	1		11811	-41	-18	47	97	1	
	11809	-54	-23	60	36	2		11811	-40	-17	46	194	1	
	11809	-53	-21	58	291	2		11816	-49	-24	57	16	1	
	11809	-46	-19	53	6	1		11812	-48	+19	48	73	3	
	11809	-44	-20	51	73	2		11812	-47	+22	48	32	2	
	11815	-55	-25	63	16	1		11812	-46	+22	47	97	2	
	11815	-54	-24	61	48	1		11821	-44	+27	46	32	1	
	11815	-51	-24	58	97	3		11809	-42	-23	50	242	2	
	11815	-49	-25	57	16	1		11809	-41	-21	48	24	1	
	11820	-46	+21	47	36	1		11809	-39	-21	47	315	3	
	11807	-41	-26	52	145	1		11809	-35	-21	44	16	1	
	11807	-40	-26	51	121	1		11809	-32	-22	43	12	3	
	11814	-23	+20	26	32	1		11809	-31	-21	41	48	1	
	11814	-22	+20	25	12	1		11815	-41	-25	51	24	3	
	11814	-20	+20	24	12	1		11815	-36	-24	47	170	4	
	11814	-17	+18	22	16	1		11820	-33	+20	35	16	1	
	11818	-4	+44	37	6	1		11819	-30	-33	48	16	1	
	11797	+3	-23	30	48	1		11807	-26	-26	42	194	2	
	11797	+3	-24	32	218	1		11814	-8	+21	16	12	2	
	11797	+4	-26	33	24	4		11814	-6	+20	15	12	1	
	11797	+5	-29	37	24	3		11814	-4	+19	14	16	1	
	11797	+5	-26	34	121	1		11818	+10	+43	37	48	2	
	11797	+6	-28	36	12	1		11818	+14	+44	39	73	2	
	11797	+6	-24	32	291	2		11797	+16	-27	38	170	1	
	11797	+7	-21	29	73	1		11797	+17	-25	36	12	1	
	11797	+8	-23	31	24	1		11797	+18	-28	40	16	2	
	11797	+9	-24	34	24	2		11797	+19	-26	38	121	1	
	11797	+12	-25	35	533	13		11797	+19	-24	36	145	3	
	11797	+14	-24	35	12	1		11797	+20	-22	35	16	1	
	11797	+14	-26	36	121	3		11797	+21	-21	35	48	1	
	11797	+16	-26	36	339	7		11797	+22	-23	36	16	5	
	11797	+18	-27	39	109	3		11797	+22	-27	41	16	1	
	11797	+19	-26	38	485	4		11797	+25	-25	41	170	1	
	11797	+21	-27	40	24	1		11797	+26	-24	41	85	1	
	11796	+24	-19	36	48	3		11797	+26	-26	42	170	2	
	11796	+25	-17	35	32	4		11797	+27	-23	41	48	3	
	11796	+26	-16	35	16	1		11797	+27	-26	43	194	3	
	11796	+29	-13	36	16	1		11797	+28	-28	44	32	2	
	11796	+29	-16	37	16	1		11797	+30	-25	44	291	3	
	11796	+33	-16	39	24	2		11797	+32	-28	47	48	2	
	11796	+34	-17	42	24	1		11797	+34	-28	48	73	2	
	11796	+39	-16	46	73	3		11797	+35	-25	46	291	1	
	11813	+37	+21	39	48	1		11825	+23	+15	24	6	1	
	11813	+39	+20	41	48	2		11796	+36	-18	44	24	1	
	11813	+40	+21	42	48	3		11796	+53	-15	56	145	3	
	11813	+42	+22	44	16	1		11813	+48	+22	49	32	1	
	11817	+40	-28	53	16	1		11813	+49	+21	50	97	1	
	11817	+42	-29	55	24	2		11813	+54	+21	55	48	1	
		(15)	(312)	(+7)	5569	122		11813	+55	+21	56	48	1	
13,547	11826	-78	-15	80	145	2		(18)	(298)	(+7)		5304	108	
N-4	11824	-72	+24	70	121	1		14,553	11829	-85	+29	83	388	1
	11823	-67	-33	76	218	2		N-2	11829	-80	+31	78	145	1
	11811	-49	-18	55	121	2			11826	-76	-15	78	194	1
	11811	-49	-20	56	170	1			11826	-76	-17	78	97	1
	11811	-47	-17	53	48	2			11826	-67	-15	70	109	1

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U.T.	No.	Δl	φ	ρ	A	s	U.T.	No.	Δl	φ	ρ	A	s
		$^{\circ}$	$^{\circ}$	$^{\circ}$					$^{\circ}$	$^{\circ}$	$^{\circ}$		
	11826	-65	-15	68	97	1		11826	-52	-14	56	12	1
	11824	-57	+24	58	145	1		11826	-51	-15	55	48	6
	11825	-54	-32	65	194	1		11826	-48	-16	54	61	2
	11816	-37	-24	48	12	1		11824	-51	+26	53	6	1
	11816	-35	-23	45	6	1		11824	-50	+27	53	12	2
	11811	-35	-19	44	291	3		11824	-46	+25	48	12	2
	11811	-34	-18	42	109	1		11824	-43	+26	45	182	2
	11811	-30	-17	39	194	1		11823	-44	-29	56	6	2
	11811	-29	-16	37	24	1		11823	-41	-33	55	6	1
	11811	-27	-17	36	61	1		11823	-39	-31	54	145	2
	11811	-26	-16	35	170	1		11822	-31	+28	36	12	1
	11812	-35	+20	36	48	3		11822	-26	+27	33	12	3
	11812	-35	+22	37	24	2		11816	-26	-24	41	6	1
	11812	-34	+23	37	16	2		11816	-23	-24	38	12	5
	11812	-33	+23	36	121	2		11811	-23	-18	34	133	5
	11809	-28	-22	40	267	3		11811	-21	-19	34	36	1
	11809	-25	-21	36	267	2		11811	-21	-18	33	6	6
	11809	-16	-20	32	24	1		11811	-20	-17	32	85	2
	11815	-26	-24	40	61	3		11811	-16	-15	27	16	2
	11815	-23	-23	37	121	2		11811	-15	-16	27	97	7
	11815	-22	-22	36	24	1		11811	-13	-16	26	24	2
	11807	-14	-26	36	145	2		11811	-13	-15	26	12	1
	11820	-14	+22	20	12	1		11811	-12	-16	26	121	3
	11827	-1	+25	18	73	3		11812	-21	+21	24	6	3
	11814	+5	+21	14	12	1		11812	-19	+24	26	6	2
	11814	+7	+19	15	16	1		11812	-17	+24	24	48	3
	11818	+22	+44	42	97	2		11809	-16	-23	34	12	1
	11818	+27	+45	45	109	1		11809	-15	-21	32	170	3
	11797	+31	-27	46	170	1		11809	-14	-19	30	97	6
	11797	+33	-28	48	24	1		11809	-14	-20	31	121	2
	11797	+34	-26	47	121	1		11809	-12	-21	30	6	1
	11797	+34	-24	45	145	1		11809	-4	-20	27	12	1
	11797	+35	-21	44	32	1		11809	-3	-22	29	6	2
	11797	+37	-26	49	73	2		11815	-15	-23	34	6	2
	11797	+38	-24	49	194	2		11815	-14	-24	34	32	5
	11797	+39	-26	51	73	1		11815	-13	-23	34	12	4
	11797	+40	-25	50	170	2		11815	-10	-24	33	6	1
	11797	+41	-23	49	36	3		11815	-9	-22	31	48	4
	11797	+44	-25	53	436	2		11815	-8	-24	33	6	2
	11797	+46	-25	55	48	1		11815	-8	-22	30	12	1
	11797	+48	-24	56	267	1		11815	-6	-23	30	16	4
	11825	+37	+15	37	12	1		11820	-13	+20	18	6	2
	11796	+50	-18	55	24	1		11820	-7	+22	16	12	6
	11796	+68	-15	71	170	1		11807	-2	-25	34	73	1
	11813	+62	+22	62	194	3		11807	-1	-24	32	48	1
	11813	+69	+23	68	145	2		11814	+13	+25	22	6	1
		(18)	(285)	(+7)	6007	77		11814	+17	+22	23	6	6
15589	11829	-76	+37	74	24	1		11814	+20	+22	25	6	3
M-5	11829	-70	+31	68	194	2		11814	+21	+21	25	6	1
	11829	-69	+34	68	16	3		11831	+35	-32	50	24	5
	11829	-65	+32	64	12	1		11831	+39	-32	55	16	1
	11832	-75	+25	74	32	1		11818	+34	+44	48	6	2
	11830	-73	-24	78	436	1		11818	+35	+44	48	24	4
	11826	-60	-15	64	12	2		11818	+40	+45	53	16	5
	11826	-59	-16	64	32	2		11818	+42	+46	54	73	1
	11826	-58	-14	63	48	3		11797	+44	-28	55	73	4
	11826	-57	-16	62	16	1		11797	+45	-25	54	32	7
	11826	-56	-15	61	24	4		11797	+46	-27	56	97	1
								11797	+47	-22	55	16	1
								11797	+48	-28	58	6	1

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U.T.	No.	Δl	φ	ρ	A	s	U.T.	No.	Δl	φ	ρ	A	s	
		$^{\circ}$	$^{\circ}$	$^{\circ}$					$^{\circ}$	$^{\circ}$	$^{\circ}$			
	11797	+50	-26	58	6	2		11828	-7	-23	31	16	5	
	11797	+52	-25	59	16	1		11812	-4	+23	16	32	1	
	11797	+53	-28	62	16	1		11809	-4	-24	32	6	1	
	11797	+53	-24	59	48	1		11809	-2	-23	30	12	1	
	11797	+54	-24	60	12	1		11809	-1	-21	27	97	2	
	11797	+55	-26	62	291	10		11809	+1	-19	26	36	1	
	11797	+59	-26	66	48	2		11809	+1	-18	25	36	4	
	11797	+60	-23	66	12	1		11809	+3	-17	25	6	1	
	11797	+61	-26	67	48	3		11809	+5	-21	28	73	1	
	11797	+63	-25	69	170	2		11809	+9	-19	28	6	2	
	11825	+50	+14	50	24	5		11815	+1	-22	28	12	1	
	11825	+51	+15	51	6	1		11815	+1	-23	30	48	2	
	11825	+53	+14	53	12	2		11815	+2	-23	30	6	1	
	11825	+54	+15	54	12	1		11815	+4	-23	30	6	2	
	11813	+75	+21	74	145	3		11815	+8	-24	34	6	1	
	11813	+78	+23	77	16	1		11807	+11	-26	35	73	1	
	11813	+83	+20	82	16	1		11807	+12	-25	35	32	1	
	11813	+85	+22	83	97	1		11831	+48	-32	60	12	2	
	11796	+80	-16	82	194	1		11831	+54	-32	64	6	1	
	(21)	(271)	(+7)		4265	221		11818	+48	+43	55	12	2	
								11818	+55	+45	61	32	3	
16.617	11836	-85	+28	83	48	1		11797	+58	-28	66	48	3	
M-3	11836	-85	+27	83	145	1		11797	+59	-27	66	16	1	
	11836	-78	+26	76	145	2		11797	+60	-25	66	73	2	
	11833	-72	+33	71	24	1		11797	+62	-26	69	242	1	
	11835	-67	+24	66	16	2		11797	+68	-24	72	24	5	
	11835	-64	+23	63	24	2		11797	+69	-26	74	32	3	
	11832	-60	+25	61	16	1		11797	+76	-23	79	36	1	
	11830	-59	-24	65	291	1		11797	+78	-25	81	170	1	
	11829	-57	+31	58	194	2		11825	+64	+14	63	12	1	
	11829	-54	+31	55	16	3		11825	+65	+14	64	16	1	
	11826	-46	-15	51	16	1		11825	+68	+15	67	48	2	
	11826	-46	-16	52	6	1		(21)	(258)	(+7)		3133	135	
	11826	-45	-17	51	48	4		17.553	11836	-70	+26	68	170	1
	11826	-45	-14	49	32	4		N-2	11836	-70	+25	68	16	1
	11826	-43	-14	47	12	5			11836	-65	+25	64	339	1
	11826	-41	-15	46	24	6			11835	-56	+23	57	61	3
	11826	-37	-13	43	6	1			11835	-55	+23	56	16	1
	11826	-36	-15	42	12	3			11835	-52	+20	52	48	1
	11826	-35	-16	42	85	3			11835	-51	+21	52	182	1
	11824	-35	+25	38	16	1			11832	-48	+24	50	24	1
	11824	-31	+23	34	6	1			11830	-46	-24	54	388	2
	11824	-30	+25	34	12	2			11829	-45	+29	48	218	2
	11824	-27	+26	33	109	2			11826	-34	-17	42	48	1
	11823	-26	-31	45	121	2			11826	-33	-18	41	61	2
	11822	-19	+26	26	6	1			11826	-28	-15	43	32	2
	11822	-17	+27	26	6	1			11826	-25	-16	34	12	1
	11822	-11	+26	22	6	1			11826	-24	-16	34	73	2
	11834	-17	-15	28	6	1			11826	-23	-16	33	73	1
	11811	-8	-19	28	85	2			11826	-21	-16	31	61	1
	11811	-7	-18	26	32	2			11824	-23	+24	27	6	1
	11811	-6	-19	27	32	3			11824	-21	+24	26	6	1
	11811	-6	-18	26	61	6			11824	-16	+23	23	24	2
	11811	-2	-17	25	48	3			11824	-16	+24	24	170	1
	11811	-2	-16	24	6	2			11823	-15	-31	41	133	1
	11811	0	-16	24	6	1			11811	+4	-19	27	97	1
	11811	0	-14	22	6	1			11811	+5	-19	27	16	1
	11811	+1	-15	23	6	1			11811	+6	-18	26	61	2
	11811	+2	-15	23	121	1								

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U.T.	No.	Δl	φ	ρ	A	s	U.T.	No.	Δl	φ	ρ	A	s
		$^{\circ}$	$^{\circ}$	$^{\circ}$					$^{\circ}$	$^{\circ}$	$^{\circ}$		
	11811	+11	-17	26	97	2		11809	+24	-20	36	61	1
	11811	+14	-16	27	194	1		11809	+25	-19	36	48	3
	11812	+6	+23	17	73	1		11809	+26	-19	37	61	3
	11809	+11	-21	29	97	1		11809	+27	-21	38	85	1
	11809	+12	-19	29	48	1		11807	+35	-23	45	12	1
	11809	+13	-21	30	24	1		11807	+36	-24	47	85	1
	11809	+14	-17	28	24	1		11807	+37	-24	48	16	1
	11809	+14	-19	30	32	1		11839	+36	-15	42	24	1
	11809	+15	-21	32	194	1		11818	+75	+45	74	24	1
	11815	+18	-24	36	12	1		(16)	(232)	(+7)		2884	80
	11807	+24	-25	40	73	1	19,548	11844	-54	-14	56	16	2
	11807	+25	-25	40	32	2	N-2	11844	-49	-13	54	48	2
	11831	+60	-31	67	16	1		11836	-48	+28	51	121	1
	11818	+65	+45	68	48	1		11836	-47	+27	50	12	1
	11797	+72	-25	77	242	1		11836	-47	+28	50	48	1
	11797	+75	-23	79	24	1		11836	-41	+25	44	291	2
	11825	+78	+15	77	48	1		11835	-32	+23	35	73	1
	11825	+80	+15	79	218	1		11835	-30	+23	34	145	1
	(17)	(245)	(+7)		3831	54		11835	-24	+23	28	6	1
18,551	11836	-60	+27	62	194	1		11835	-23	+21	26	145	2
N-4	11836	-58	+26	60	97	2		11832	-23	+24	28	12	1
	11836	-53	+25	54	364	2		11829	-20	+29	29	97	1
	11835	-45	+23	46	61	1		11829	-18	+31	30	16	1
	11835	-44	+23	45	61	4		11829	-16	+31	27	61	3
	11835	-43	+22	44	48	1		11830	-19	-24	36	279	1
	11835	-43	+24	45	12	1		11824	+1	+25	18	73	2
	11835	-41	+18	42	16	1		11824	+6	+23	16	16	2
	11835	-39	+22	42	12	1		11824	+9	+25	21	121	1
	11835	-37	+21	39	121	3		11826	+3	-16	24	24	2
	11832	-36	+24	39	16	1		11826	+5	-15	24	61	1
	11829	-33	+29	38	121	2		11823	+10	-32	40	16	1
	11829	-32	+31	38	48	1		11823	+12	-31	39	48	1
	11829	-29	+31	36	61	2		11842	+25	-14	33	16	1
	11830	-33	-24	45	291	2		11842	+27	-14	35	6	2
	11826	-19	-18	33	24	2		11811	+30	-18	39	24	3
	11826	-15	-15	26	24	2		11811	+31	-17	38	12	1
	11826	-11	-16	26	36	1		11811	+32	-17	39	12	1
	11826	-10	-14	24	12	1		11811	+34	-17	41	16	1
	11826	-8	-15	25	36	1		11811	+36	-17	44	48	2
	11826	-7	-15	24	48	1		11811	+40	-16	46	218	1
	11824	-10	+25	22	32	1		11812	+32	+24	35	32	1
	11824	-8	+24	19	24	4		11838	+34	+12	34	73	1
	11824	-5	+23	16	12	1		11838	+35	+13	35	36	1
	11824	-4	+25	19	109	1		11838	+39	+12	39	36	1
	11823	-2	-31	38	97	1		11838	+40	+12	40	61	1
	11811	+16	-19	32	48	3		11809	+37	-20	46	73	1
	11811	+18	-19	33	6	2		11809	+37	-18	45	16	1
	11811	+18	-17	31	6	1		11809	+40	-20	47	109	1
	11811	+20	-17	33	36	2		11807	+47	-24	55	97	1
	11811	+24	-17	35	32	3		11807	+50	-24	57	97	1
	11811	+25	-16	34	32	3		11841	+51	-21	56	121	1
	11811	+26	-16	35	182	1		(16)	(219)	(+7)		2832	54
	11816	+17	-24	36	16	3	20,552	11846	-80	+22	79	145	1
	11812	+19	+23	25	16	1	N-2	11844	-41	-14	45	12	1
	11838	+22	+12	23	32	1		11844	-35	-13	40	32	1
	11838	+24	+11	24	12	2		11845	-36	+18	37	16	1
	11838	+24	+12	25	12	2							
	11838	+26	+12	26	61	2							

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U. T.	No.	Δl	φ	ρ	A	s	U. T.	No.	Δl	φ	ρ	A	s
		$^{\circ}$	$^{\circ}$	$^{\circ}$					$^{\circ}$	$^{\circ}$	$^{\circ}$		
	11836	-36	+29	41	121	4		11826	+27	-16	36	97	4
	11836	-29	+25	34	242	1		11826	+27	-17	37	24	1
	11840	-30	+12	31	24	1		11826	+30	-16	37	32	2
	11840	-30	+14	32	16	1		11826	+32	-15	38	48	1
	11840	-28	+11	28	24	1		11824	+35	+25	38	121	1
	11840	-26	+12	27	24	1		11823	+37	-31	52	16	1
	11840	-25	+11	25	73	1		11842	+55	-13	58	24	2
	11835	-18	+23	24	194	2		11812	+57	+22	58	6	1
	11835	-16	+20	21	12	1		11838	+61	+11	61	48	2
	11835	-14	+20	19	48	2		11838	+67	+12	66	16	1
	11835	-13	+22	19	24	1		11809	+64	-20	68	32	1
	11835	-10	+22	18	109	1		11809	+66	-20	70	48	1
	11830	-11	-26	35	16	1		11820	+65	+21	64	32	1
	11830	-10	-25	34	12	1		11820	+66	+18	65	36	1
	11830	-7	-24	33	242	2		11811	+66	-16	69	145	1
	11829	-7	+30	24	109	2		11847	+71	+21	70	48	1
	11829	-4	+32	25	6	2		11807	+76	-23	79	73	1
	11829	-3	+31	24	6	2							
	11824	+14	+26	24	32	1		(18)	(192)	(+7)		1941	50
	11824	+23	+25	28	145	1	22.681	11855	-80	-28	87	145	1
	11826	+15	-16	27	36	2	M-2	11853	-62	-18	66	12	2
	11826	+16	-16	28	6	1		11853	-61	-17	65	6	1
	11826	+18	-15	28	73	1		11853	-59	-18	64	16	2
	11823	+25	-31	45	24	2		11846	-54	+22	55	170	4
	11842	+38	-14	44	32	1		11846	-49	+23	51	6	1
	11842	+42	-14	46	24	1		11844	-6	-12	19	12	2
	11812	+45	+24	47	12	1		11836	-6	+28	23	16	7
	11811	+47	-17	53	12	1		11836	-5	+29	24	6	2
	11811	+54	-16	58	145	1		11836	-4	+29	24	6	1
	11838	+48	+11	48	97	3		11836	-3	+28	22	6	1
	11838	+54	+12	54	24	1		11836	-2	+26	21	133	4
	11838	+55	+12	55	36	1		11852	-3	+35	28	6	1
	11809	+50	-20	56	48	1		11852	-2	+36	30	6	1
	11809	+54	-20	59	97	1		11852	0	+37	31	6	3
	11807	+59	-25	66	48	1		11852	+1	+37	31	6	3
	11807	+63	-25	68	48	1		11852	+5	+34	28	6	4
	11820	+64	+21	63	24	1		11840	-2	+15	8	12	3
	11841	+66	-22	71	48	1		11840	-1	+15	8	6	3
	(19)	(206)	(+7)		2518	55		11840	-1	+14	7	6	1
21.553	11846	-69	+21	67	145	2		11840	-1	+13	6	12	2
N-3	11836	-24	+29	33	12	2		11840	+3	+10	5	16	1
	11836	-22	+28	30	12	2		11840	+4	+12	6	12	3
	11836	-16	+25	24	194	1		11840	+6	+13	8	158	1
	11844	-22	-13	29	24	1		11851	+7	+26	22	6	3
	11840	-17	+12	18	6	1		11851	+7	+28	24	6	3
	11840	-16	+12	17	24	1		11835	+8	+24	20	48	5
	11840	-14	+13	16	6	1		11835	+11	+24	20	6	3
	11840	-9	+12	12	145	2		11835	+14	+24	22	6	2
	11835	-5	+23	16	109	1		11835	+15	+23	22	6	2
	11835	+1	+21	14	6	3		11835	+16	+23	23	61	2
	11835	+4	+22	15	85	2		11835	+17	+22	23	12	3
	11830	+3	-25	33	6	1		11830	+16	-25	36	12	1
	11830	+5	-23	30	12	1		11830	+17	-23	35	16	2
	11830	+6	-24	32	206	2		11830	+18	-23	35	12	5
	11829	+5	+30	24	85	1		11830	+20	-23	36	145	3
	11829	+6	+33	26	6	1		11829	+16	+34	31	6	2
	11829	+9	+33	27	6	1		11829	+19	+36	34	6	3
	11829	+13	+33	29	6	1		11829	+19	+31	30	48	2
								11826	+44	-15	48	16	2

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U. T.	No.	Δl	φ	ρ	A	s	U. T.	No.	Δl	φ	ρ	A	s
		$^{\circ}$	$^{\circ}$	$^{\circ}$					$^{\circ}$	$^{\circ}$	$^{\circ}$		
	11826	+45	-15	49	12	3		11850	+68	-17	71	16	4
	11826	+46	-14	50	32	2		(18) (165)	(+7)			1571	102
	11824	+49	+26	51	109	1							
	11823	+54	-30	63	12	1							
	11850	+59	-16	64	6	2	24,771	11858	-61	-28	67	194	1
	11849	+70	-24	74	24	1	N-1	11855	-60	-27	67	121	1
	11849	+74	-24	79	97	1		11855	-57	-29	66	145	1
	11842	+73	-12	75	24	1		11854	-57	-16	62	24	1
	11838	+76	+11	76	61	1		11854	-53	-14	56	24	1
	11811	+85	-16	86	97	1		11853	-29	-18	38	32	1
	11820	+86	+22	84	36	1		11846	-26	+21	29	121	1
	(20) (178)	(+7)			1708	112		11836	+24	+25	29	145	1
23,602	11858	-76	-29	81	218	2		11840	+35	+11	35	170	1
M-5	11855	-70	-29	76	194	1		11835	+44	+20	45	97	1
	11855	-68	-29	75	32	1		11830	+45	-24	54	145	1
	11854	-70	-16	73	6	1		(9) (150)	(+7)			1218	11
	11854	-66	-14	69	6	4	25,549	11860	-76	+20	75	48	1
	11854	-66	-15	70	32	3	N-3	11860	-74	+19	72	242	1
	11854	-62	-14	65	12	2		11861	-75	+32	74	48	1
	11857	-68	+21	66	12	2		11864	-73	-29	78	48	2
	11853	-51	-17	56	12	2		11858	-59	-29	67	24	2
	11853	-49	-18	55	16	5		11858	-56	-30	65	12	1
	11853	-47	-16	52	6	2		11858	-54	-30	64	16	1
	11853	-46	-18	53	12	2		11858	-53	-30	63	12	1
	11853	-45	-18	51	32	2		11858	-51	-30	61	315	2
	11853	-45	-19	52	12	3		11855	-47	-28	58	109	2
	11846	-44	+24	45	6	1		11855	-45	-30	56	194	1
	11846	-41	+23	43	133	2		11854	-46	-18	52	61	2
	11846	-39	+25	43	6	1		11854	-41	-15	46	16	3
	11836	+ 5	+28	23	12	4		11854	-41	-14	46	61	1
	11836	+ 6	+27	23	6	1		11853	-16	-19	32	12	1
	11836	+ 9	+26	22	121	2		11846	-15	+21	20	170	1
	11836	+11	+26	23	6	1		11846	-14	+22	20	12	1
	11836	+13	+26	24	6	1		11863	+13	+24	21	16	1
	11840	+10	+10	12	6	1		11862	+31	-14	36	6	1
	11840	+10	+12	12	6	1		11862	+33	-14	39	24	2
	11840	+14	+11	15	6	1		11836	+34	+25	37	97	1
	11840	+15	+12	16	6	3		11836	+35	+26	39	6	1
	11840	+19	+13	21	121	3		11840	+46	+12	46	194	1
	11852	+11	+37	33	6	1		11835	+55	+21	56	48	1
	11852	+13	+37	33	6	1		11830	+57	-23	63	242	1
	11851	+21	+27	28	12	3		11830	+57	-26	64	12	1
	11835	+21	+24	26	12	5		(14) (140)	(+7)			2045	34
	11835	+27	+23	31	6	2	26,587	11860	-64	+20	63	73	1
	11835	+30	+23	34	48	1	N-2	11860	-61	+19	61	388	1
	11830	+28	-26	44	12	4		11861	-63	+32	63	48	1
	11830	+29	-25	44	16	5		11864	-57	-28	66	24	1
	11830	+32	-24	45	145	2		11858	-46	-29	57	73	1
	11829	+32	+30	37	16	5		11858	-40	-30	54	97	2
	11856	+36	+34	44	12	2		11858	-37	-29	51	291	2
	11826	+57	-16	62	6	1		11855	-34	-27	47	194	3
	11826	+57	-15	62	6	2		11855	-33	-29	47	194	2
	11826	+60	-15	64	48	2		11855	-33	-32	49	12	1
	11824	+60	+24	62	6	3		11855	-31	-30	47	48	1
	11824	+61	+25	62	121	2		11855	-30	-27	46	16	1
	11824	+64	+25	65	12	1		11854	-33	-18	41	48	1
	11823	+65	-31	72	6	1							
	11850	+66	-19	70	16	1							

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U.T.	No.	Δl	φ	ρ	A	s	U.T.	No.	Δl	φ	ρ	A	s	
		$^{\circ}$	$^{\circ}$	$^{\circ}$					$^{\circ}$	$^{\circ}$	$^{\circ}$			
	11854	-31	-16	38	12	1		11846	+26	+22	29	121	1	
	11854	-25	-15	34	109	1		11840	+88	+13	88	242	1	
	11846	-1	+21	14	121	1		(11)	(99)	(+7)		1772	56	
	11862	+43	-15	47	12	1		29,598	11870	-69	+37	69	24	1
	11862	+45	-16	50	61	1	M-2	11870	-69	+39	69	12	1	
	11836	+47	+25	49	73	1		11867	-52	+32	55	6	1	
	11840	+60	+12	60	194	1		11867	-51	+32	54	6	1	
	11835	+69	+21	68	24	1		11867	-50	+31	53	24	3	
	11830	+70	-22	74	218	1		11861	-26	+34	36	16	3	
	(12)	(126)	(+7)		2330	27		11860	-24	+21	27	12	1	
27,740	11867	-75	+32	74	73	2		11860	-21	+20	24	6	3	
M-1	11860	-50	+21	51	16	1		11860	-19	+19	24	339	1	
	11860	-47	+21	48	48	1		11860	-18	+19	23	12	2	
	11860	-45	+20	46	436	1		11858	-7	-29	37	12	3	
	11860	-45	+18	45	12	1		11858	-6	-29	37	24	4	
	11861	-48	+34	52	48	1		11858	-5	-30	37	32	6	
	11864	-39	-26	51	24	2		11858	-5	-27	36	36	14	
	11858	-30	-29	46	73	1		11858	-2	-29	37	24	11	
	11858	-24	-28	43	16	1		11858	+2	-28	36	230	5	
	11858	-24	-29	44	16	2		11858	+3	-30	37	16	2	
	11858	-22	-29	43	339	3		11855	+5	-27	36	6	2	
	11855	-18	-27	39	16	2		11855	+6	-29	37	206	3	
	11855	-16	-29	40	339	3		11855	+9	-28	36	6	2	
	11855	-14	-27	37	16	1		11854	+11	-16	26	6	3	
	11854	-16	-17	30	32	3		11854	+14	-15	26	12	5	
	11854	-13	-16	27	12	1		11854	+16	-14	26	32	2	
	11854	-12	-15	26	32	1		11872	+22	+19	25	12	3	
	11854	-8	-14	24	61	1		11872	+23	+17	25	6	1	
	11865	-5	-18	26	12	1		11872	+25	+18	27	12	6	
	11865	-4	-19	26	12	1		11868	+31	+46	47	12	2	
	11846	+14	+22	20	121	1		11871	+38	-17	45	16	3	
	11840	+77	+13	77	242	1		11846	+39	+23	42	121	2	
	(10)	(111)	(+7)		1996	32		(11)	(86)	(+7)		1278	96	
28,604	11870	-81	+37	79	73	1		30,665	11861	-11	+33	27	32	2
M-4	11870	-80	+36	78	24	1	N-2	11861	-9	+33	27	24	1	
	11867	-66	+32	65	16	1		11860	-7	+19	15	436	2	
	11867	-65	+31	65	48	2		11858	+7	-29	37	145	2	
	11861	-38	+34	45	24	1		11858	+9	-30	38	16	1	
	11860	-37	+20	39	12	1		11858	+12	-29	38	85	3	
	11860	-35	+19	36	364	2		11858	+14	-31	40	32	3	
	11858	-19	-29	42	24	4		11858	+15	-29	39	218	1	
	11858	-18	-29	41	32	4		11855	+19	-29	42	339	1	
	11858	-14	-27	37	12	3		11854	+30	-15	36	48	1	
	11858	-11	-28	37	242	3		11873	+33	+34	41	24	1	
	11858	-10	-30	38	61	2		11873	+36	+34	43	12	1	
	11869	-14	-18	29	6	1		11872	+35	+16	36	145	2	
	11869	-14	-20	31	12	1		11872	+37	+16	37	12	1	
	11855	-8	-28	36	12	4		11872	+39	+16	40	61	1	
	11855	-7	-27	35	24	2		11872	+41	+16	42	97	1	
	11855	-6	-29	38	291	2		11868	+41	+46	54	36	1	
	11855	-2	-26	34	6	1		11868	+43	+47	55	16	1	
	11854	-6	-17	25	12	3		11868	+44	+44	54	36	1	
	11854	-3	-16	24	16	5		11868	+45	+45	55	24	1	
	11854	-3	-17	25	6	2		11868	+46	+44	55	24	1	
	11854	0	-15	23	16	3		11846	+53	+21	53	97	1	
	11854	+3	-14	22	48	2		(9)	(72)	(+7)		1959	30	
	11868	+16	+48	44	12	2		Mean for 30 days, $A = 2994$, $r = 197.0$						
	11868	+19	+46	43	16	1								